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ABSTRACT

This publication details the critical issues being debated in telecommunications today and their impact on colleges and universities in the future. An introduction identifies important changes in recent years including technological advances, the digitizing of communication, privatization and commercialization of the Internet, possible significant revision of federal and state telecommunications law, and universities' growing dependence on telecommunications. Discussion of each of five current or emerging issues follows. The discussion of universal access, service, and affordability notes that telecommunication monopolies which benefited higher education are being replaced by competition possibly causing initially higher costs, the replacement of traditional distance learning formats, and challenges to university libraries. The next section discusses balancing the free exchange of ideas and dissemination of knowledge with the intellectual property rights of authors, publishers, and copyright owners. A section on privacy and free speech discusses protection for free inquiry and expression and supports measures under individual control rather than government intrusion into freedom of expression. A section on emerging issues looks at realizing the potential for distance education, information services, and professional training and lifelong learning. A final section looks at how telecommunications changes are offering higher education an array of opportunities to collaborate with other groups and organizations. (JB)

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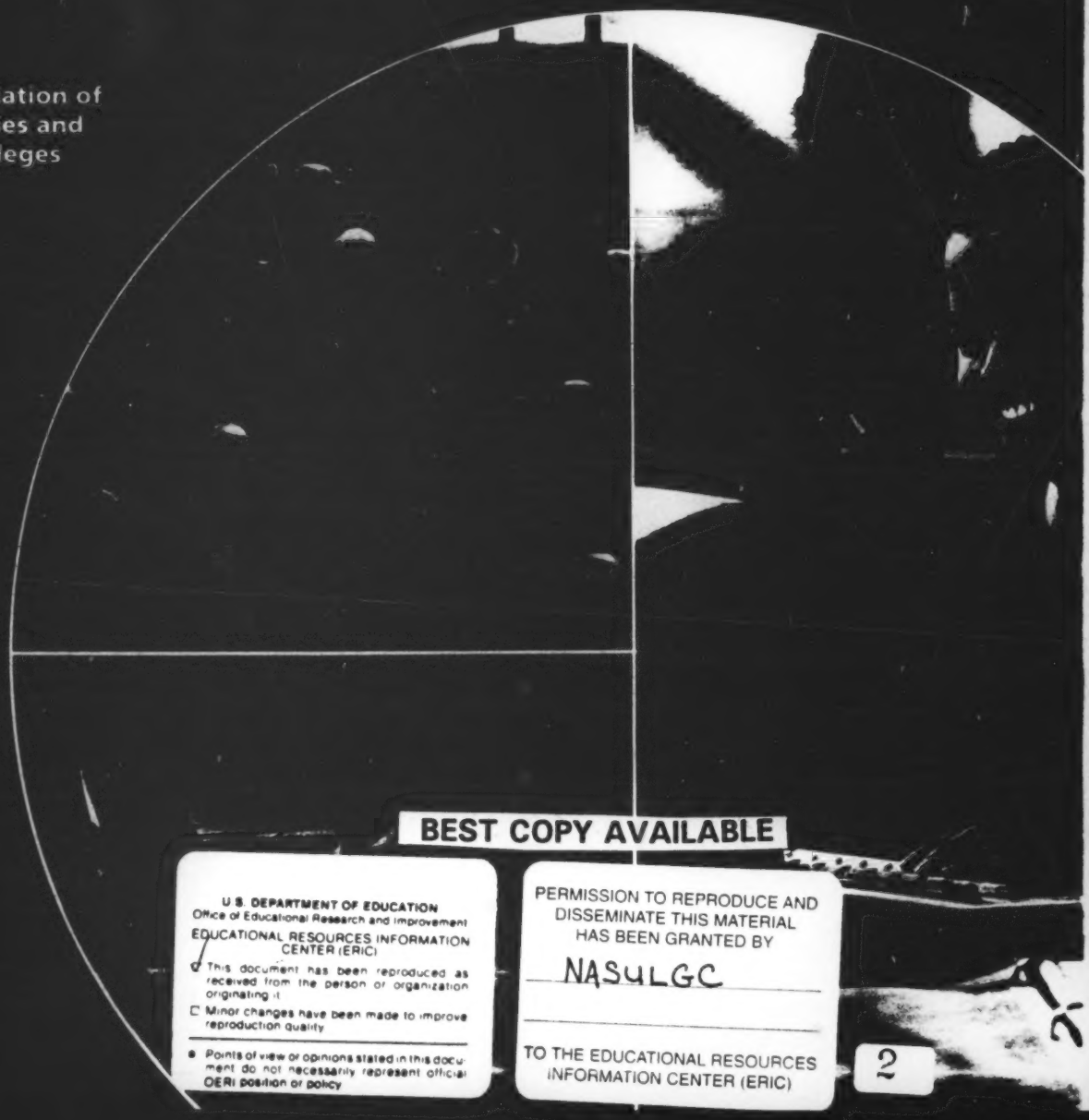
The Changing Telecommunications Marketplace

Issues and Challenges for Higher Education

National Association of State Universities and Land-Grant Colleges

Commission on Information Technologies



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NASULGC

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

November 1, 1995

Dear Colleague:

Perhaps never before in history has higher education faced such sweeping changes as it does today in telecommunications.

This publication succinctly details the critical issues being debated — from universal access/service/affordability to emerging partnership opportunities — issues that will have a significant impact on colleges and universities for years to come.

"The Changing Telecommunications Marketplace: Issues and Challenges for Higher Education" is the result of many hours of work by the NASULGC Inter-Board Task Force with input from many others. The task force has done an excellent job of dealing with the complex and technical issues to which higher education must respond in order to be viable today and in the future.

In its conclusion this publication states, "Higher education is being forced to examine the ways in which it can seize the opportunities presented by the Information Age."

The changing telecommunications marketplace abounds with opportunities. It is up to higher education leaders to seize the opportunity and take part in discussions and debates about these issues that shall so profoundly affect our institutions and the public they serve.

Sincerely,

Samuel H. Smith

Samuel H. Smith
President, Washington State University
Chair, NASULGC Commission on Information Technologies

INTRODUCTION

In the last several years, newspapers, magazines and television have "discovered" advanced telecommunications, producing story after story on topics such as the Internet, the World Wide Web, cellular phones, direct broadcast television, online services, and local area networks. For universities, however, the growing power of telecommunications is old news. Institutions of higher education have known for some time that advanced communications technologies are vital to their research, teaching, and outreach missions and are becoming more important all the time.

What is new is that, as the 21st Century approaches, four dramatic changes are taking place in telecommunications that could have a major impact on higher education. The first change is technological. Different forms of telecommunication — telephone, broadcast television, cable television, computer networking — were once based on technologies that did not overlap. Now, however, the digital revolution is sweeping through all forms of advanced telecommunication while transforming older communications methods such as printing and photography, too.

The digitizing of communications means that all forms of information can transmitted and received quickly, accurately, and widely over electronic networks. It also means that media that were once separate — radio, television, cable, telephony, newspapers, etc. — are now merging, and industries that were once relatively isolated from one another can compete head to head. And it means that information can be transmitted more efficiently and cheaply.

This merging of technologies could have particularly profound effects on an area that higher education has pioneered — distance education. Universities have long recognized that two-way voice and video communication could be used to make education accessible to a wider audience. They have taken the lead in showing how satellites, microwave towers, cable television and fiber optics can be brought together. The digital revolution could make distance education an even more powerful educational tool. This will be occurring at a time when universities will want to make even greater use of distance education to meet society's growing need for retraining and to serve an increasingly diverse student population.

The second dramatic change taking place is that the Internet is being privatized

and commercialized. Universities have been closely involved in the development of the world-wide information network, which began in 1969 as the defense department's ARPANET. The Internet started to develop into its current form with universities' help in the mid 1980s, when a coalition of Michigan universities called MERIT entered into a cooperative agreement with the National Science Foundation to create and run NSFnet, a high speed network linking several supercomputer sites. NSFnet became the backbone of the Internet. University computing research and software development laid the groundwork for the expansion and evolution of the world-wide network used by millions of people today to access information resources throughout the world.

During the 1980s, the Internet's primary role was to help scientific, research and educational organizations. NSF funded much of the backbone and regional networks. In 1990 MERIT contracted out management of the NSFnet to a not-for-profit group funded by IBM and MCI. Other corporations set up private high-speed networks to offer services to the commercial sector. The federal government is now phasing out the NSF subsidy to the Internet backbone and regional networks. The growth of commercial networks and the phase-out of the federal role has led to a growing commercialization of the Internet. By 1994, half of the networks linked to the Internet were commercial. Universities continue to safeguard the Internet's scientific, research and educational roles, but private enterprise's presence on the network has been exploding.

The third dramatic change is closely related to the first two: Congress is now considering major revisions in the basic laws that regulate the telecommunications industry, and state governments are also taking action. (The telecommunications industry includes telephone, radio, television, and cable services as well as such new areas as personal telecommunications systems.) Most analysts believe that the result of all this activity will be some form of deregulation, i.e. most current laws that prevent or limit competition within and between different segments of the telecommunications industry will be swept away. Local phone companies will be able to offer long distance; long distance companies will offer local service; cable companies will offer telephone service; phone companies will provide television service; etc.

The Washington Higher Education Telecommunication System, operated by Washington State University, celebrates its tenth anniversary this year. During the 1994–95 academic year, it enrolled 5,000 students and offered 6,800 hours of instruction and 1,200 hours of video conferences.

Exactly how this deregulation will proceed remains very unclear, however, with powerful communication companies fighting to protect their markets during the transition to full competition. One of the purposes of the regulatory regime now under attack was to curb monopolies and ensure that users were not charged high rates because of monopoly control of markets and infrastructure. If the regulations are swept away completely, many observers are worried that the result, at least in the short term, would be monopoly control that would raise prices and decrease services.

Moreover, deregulation could also mean the repeal of current laws that have been important for universities. These include regulations that require telephone companies, cable companies and others to provide access to educational institutions and other nonprofit or public interest groups. They also include laws that allow federal, state, and local regulators to reallocate excess funds from regulated telecommunications companies to educational and public interest organizations.

The final change is the universities' growing dependence on telecommunications. Increasing numbers of students are arriving on campus computer literate and expecting to be able to use advanced technology resources. Universities are spending a growing percentage of their budgets for computers and telecommunications. They are using telecommunications more and more extensively in instruction and research and in their service mission.

The first three changes could affect the way universities use telecommunications. All four raise difficult questions: in a deregulated, more competitive environment will universities continue to enjoy the access to affordable telecommunications that they have now? Which laws and regulations should apply as all forms of telecommunications merge and as the Internet becomes a commercial medium? Copyright laws govern print, but should they apply to electronic data? Obscenity/pornography laws apply to the entertainment industry, but can and should they apply to online images? Should e-mail enjoy the same privacy protections that apply to regular mail?

To ensure that telecommunications continues to be a tool that higher education can use effectively to support teaching, research and outreach, university officials must be active participants in the debates that are now going on in Washington and state capitals to decide the future of government policy. This publication outlines what NASULGC's Commission on Information Technologies believes are the most important issues for higher education in those debates.

Universal Access/Service/Affordability

CURRENT ISSUES

Local telephone companies are now required by law to provide "universal service," i.e. through a complex system of subsidies they must make affordable basic phone service available to anyone who wants it. As communications technologies have converged and many forms of advanced telecommunications have become more important to our everyday lives, "universal service" has taken on other meanings as well. Analysts now use universal service or "universal access" to describe steps that might be taken to prevent America from dividing into a nation of information "haves" and "have-nots." For universities, the dramatic changes described above pose several challenges in the areas of universal access, service, and affordability.

Higher education has been able to benefit greatly from telecommunications in the past because colleges and universities all over the country enjoyed full access to the latest technologies and services at affordable rates. In some cases, however, that access and affordability was guaranteed by federal or state regulations, especially requirements placed on phone or cable companies who enjoyed a monopoly in a particular area. Now those regulations are changing rapidly, and monopolies are being replaced by competition.

The good news is that most analysts agree that, in the long run, more competition will help to decrease the costs of access to advanced telecommunications, spur innovation, and expand access. However, some fear that the long run could be very long indeed and the transition period could prove difficult for higher education. The challenge for higher education will be to work with policy makers to ensure that colleges and universities are not forced to pay a high price for deregulation — the loss of guaranteed, affordable access — long before they enjoy the benefits of increased competition.

In addition, universities will also have to work with policy makers to avoid a higher education haves/have-nots problem. In a deregulated telecommunications world, many universities — especially research universities in large, urban areas — will be eagerly sought after as customers for telecommunications providers. They will be in an excellent position to drive good bargains to get affordable access to a wide range of services. But this may not be true for all institutions.

Smaller institutions or those in rural states might find themselves at a disadvantage in a fully competitive telecommunications market, making it difficult to continue to enjoy their current access to electronic information. To prevent this from happening, university officials will have to pay close attention to the regulatory debates in Washington and state capitals, articulating the need for solutions that will meet the specific needs of local institutions and the requirements of different markets.

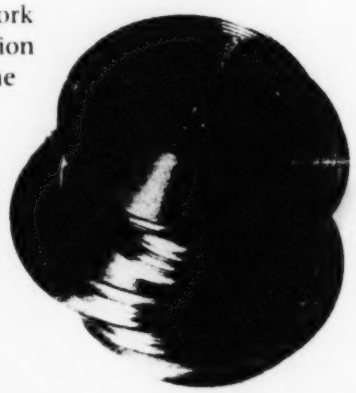
Over the past two years, the University of Tennessee System, including campuses in Knoxville, Chattanooga, Martin, Memphis and Tullahoma have enrolled 4,275 students in 167 different credit classes taught via two-way compressed video.

In general, colleges and universities' information needs will be best served if states are allowed to take actions that are appropriate to local needs.

The digitization of all forms of advanced communication poses other access/service/affordability challenges, too. For example, colleges and universities have traditionally viewed distance learning as television-based activity, involving cable networks or satellites. The development of advanced computer networks opens up the possibility of new forms of distance learning. University officials will have to decide how to allocate their resources so that the transmission of data over computer networks can supplement traditional video distance learning. In the not-too-distant future, university leaders may well have to decide whether to *replace* traditional distance learning technologies with advanced interactive computer networks transmitting voice, video and data.

The convergence of technologies also poses challenges to university libraries. In the past, one of the measures of a library's excellence was the number of volumes on its shelves. More and more, libraries are being judged by the amount of information they can access electronically, some of it on their shelves, but much of it available only on-line. Libraries are also storing increasing amounts of information on CD-ROMS or local computer networks. Library administrators will have to base policy and financial decisions on the changing demands of the information age.

In sum, the historic changes now occurring in advanced telecommunications mean university leaders will have to find creative ways to invest resources, change policies, and work with government decision makers to guarantee the access, service and affordability required to meet higher education's information needs.



Intellectual Property and the Dissemination of Knowledge

Balancing society's need for the free exchange of ideas and dissemination knowledge with the intellectual property rights of authors, publishers and copyright owners has never been easy, even when most information was stored and transmitted on the printed page. Most in higher education agree, however, that the Copyright Act of 1976 has done a good job of balancing the competing interests in a way that supports colleges' and universities' scholarship and teaching.

Advanced technologies now pose new challenges to this delicate balance of interests, rights, and responsibilities. New kinds of intellectual properties — databases, electronic journals, software — have been created. What kinds of protections should they enjoy? Digital technology makes it possible instantly to access, copy and disseminate books and articles in libraries and other databases all over the world. Images and sounds can be captured just as easily. Are new kinds of protections necessary? How should the holders of copyrights be compensated for use of their material?

These and other serious questions raised by advances in telecommunication have led many in government, academia, and the creative community to call for an overhaul of the Copyright Act. Revisions appear inevitable. The Commerce Department's National Information Infrastructure Administration (NIIA) has taken a first step, forming a Working Group on Intellectual Rights to reexamine copyright law in the information age. A draft report by the group proposes significant changes in a number of areas of special interest to higher education, including publication, distribution by transmission, educational uses, and fair use.

More than thirty faculty at Oregon State University are involved in the Web Instructional Productivity Project, redesigning their courses to be delivered via the World Wide Web.

Fair use — the reproduction and other use without permission or payment of portions of copyrighted works for criticism, news reporting, teaching, scholarship and research — is particularly important to higher education. Copyright holders are entitled to a fair and reasonable return for use of their creations. If fair use is curtailed, however, higher education's costs will rise dramatically, students' and professors' access to needed knowledge will be restricted, and it will be harder for universities to carry our their key missions. When Congress takes up the copyright question, therefore, higher education leaders will want to ensure both the preservation of current fair use and its extension to the new electronic media.

Privacy/Free Speech

Universities have traditionally taken the lead in defending free inquiry and free expression because they are indispensable to the academic enterprise. The development of advanced telecommunications, however, is confronting higher education with some new issues in this area. For example, Congress and state legislatures are worried that because advanced electronic networks are essentially unregulated, they might be used for pornography and harassment. Law makers are considering legislation to put controls on electronic information and to hold institutions that provide networks liable for the content that is transmitted. In addition, new techniques for protecting electronic information by encrypting it are being developed, but the government is trying to preserve its ability to monitor certain communications by limiting encryption.

The University of Minnesota's Department of Independent Study lets students send in assignments and receive instructor feedback via electronic mail in dozens of courses, from American government to principles of management. The department is also offering its first full-fledged Internet class, enrolling and teaching students from around the world on-line.

As educators, legislators, and citizens struggle with this problem, care must be taken to protect free inquiry and free expression, which are not only indispensable to higher education and educational values but are the foundation of a free and open society. The promise of advanced telecommunications and its ability to create a more educated citizenry should also not be jeopardized. Moreover, technology solutions such as blocking software now exist that will allow parents and other private citizens concerned about some of the information on electronic networks to more easily control what comes into their homes. These offer a better solution to concerns about the misuse of communications technology than does government intrusion into freedom of expression.

Like free speech, the citizen's right to privacy is an essential American value and one that is vital to the mission of higher education. By making possible instant access to so much previously shielded information, new information technologies have created the potential for infringing individual rights.

To protect privacy, private communications via computer should be as protected as communicating via the mail or by telephone. Similarly, personal files stored on computers should have the same privacy safeguards as files stored in cabinets, desks or offices.

Realizing Information Technology's Potential

EMERGING ISSUES

Higher education is already using telecommunications as a powerful tool for teaching, research and outreach. The ongoing rapid technology and policy changes, however, makes the potential future impact of advanced communication almost limitless. To realize this potential, university officials must focus on telecommunications as they make their plans to guide their institutions into the 21st Century, and they must stay involved in the policy debates that will shape the Information Age. Advanced telecommunications will have an especially strong impact on distance education, information services, and professional training/lifelong learning.

Distance education

Telecommunications technology helps universities overcome the constraints that time, geography, and cost used to place on acquiring and disseminating knowledge of different kinds to a wide variety of users. The digitization of all forms of telecommunication, and the lowering of costs, means these constraints will become even less important in the future. Moreover, as mentioned earlier, the development of digitized multimedia networks opens up the possibility of new forms of distance learning, with the transmission of data over computer networks supplementing traditional video distance learning.

Advances in telecommunications offer an expanding array of cost effective opportunities to reach under-represented populations and to offer courses in rural areas. A wider range of students who otherwise might not be able to enroll in courses on campus can participate in needed multimedia classes offered conveniently close to or even in their homes. Routine instructional programs, whether on or off-campus will be enhanced and made even more interactive through the use of advanced distance education technology.

At Pennsylvania State University potential students can apply for admission electronically and search the university Web Page for course and other information. Once they enroll, students can register for classes via touch tone phone, learn in computer-equipped electronic classrooms, take advantage of computer labs and high-speed network services in their residence halls, and even find out their grades via toll-free number.

Information services

Advances in telecommunication are bringing a wide menu of external resources to campus from business, industry, government, or other educational institutions. Information services such as the Library of Congress or Smithsonian Institutions that can now be linked to campuses electronically are

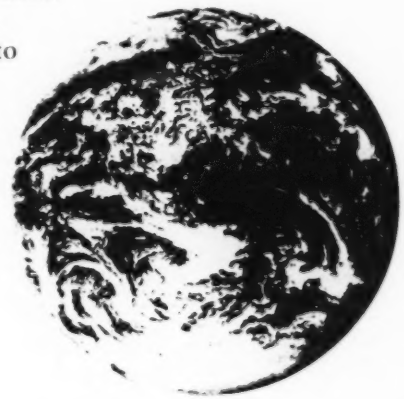
being supplemented by a multitude of new and ever-more user friendly resources that can be integrated into distance learning.

Library systems linked to national and international resources through telecommunications technology are also already proving to be an extraordinary research tool for faculty and graduate students. Moreover, with current technology researchers can coordinate efforts with colleagues in distant locations and faculty at a single university can disseminate the results of their efforts to national and international audiences of scholars. As communications technology develops further, the result will be a "virtual university" or a virtual community of scholars that can access multimedia databases, collaborate instantly across time zones and publish their research results on advanced worldwide networks.

Since Oklahoma State University pioneered the delivery of compressed video courses in 1989, the university has delivered nearly 200 courses to over 1,200 students. In almost 30 remote locations, everywhere from college campuses to business sites, students can take nine masters' degree programs, ranging from electrical engineering to computer science and business.

Professional training/lifelong learning

Engineers, architects, managers, accountants, and other professionals today operate in environments that are being rapidly transformed thanks to technological progress in computing, networking and other areas. Telecommunications can help students who enter rapidly changing fields gain hands-on experience and meet the lifelong learning needs of professionals. In turn, the network of contacts professionals develop with each other and with institutions of higher education through lifelong learning programs can have a positive impact on universities: they create an attentive audience predisposed to favor programs that require the support and cooperation of business and industry groups.



Emerging Partnership Opportunities

The changes in advanced communications technology are presenting higher education with a vast array of opportunities to partner with other groups and organizations, but the changes have also made the "rules of the game" quite different from what they were in the past.

Telecommunications technology is making possible collaborations that were previously impractical, if not actually impossible, because of geography and cost. Higher education institutions could once establish linkages only within in their local area. In distance education, for example, land-grant universities usually delivered courses at locations that were within driving distance for faculty. But changes in technology and regulation have led to institutions such as the National Technological University and Mind Extension University that permit collaboration that ignores institutional and geographic boundaries in delivering educational services to customers.

Advanced telecommunications is also allowing new kinds of international partnerships. Institutions and faculties are forging research, teaching, and service links with counterparts across borders and oceans that would have been impossible even a decade ago.

Telecommunications have not just lifted geographical barriers, however. Advanced technologies have also allowed the formation of new kinds of partnerships, creating a new form of electronic university outreach. Higher education, for example, has the opportunity to collaborate more closely than ever with K–12 schools in curriculum, school management, teacher training, in service training, and action research thanks to advances in communications. Technology has also opened up the possibility to undertake new initiatives with community organizations and social service providers.

At Kansas State University the libraries are leading a reinvention of campus "computer architecture" by installing a distributed integrated library access and database system. The system will be the cornerstone of a re-engineered library that makes materials more available and accessible to users.

Universities have traditionally formed partnerships with industry, but these can be greatly enhanced in the Information Age. Higher education will be a rich source of advances through university research and development, and industries' new breakthroughs will make it easier for universities to pursue their missions. New forms of collaboration on research, business incubation, and technology transfer will be possible.

Changes in communications technology have also changed the rules of the game. Exclusive,

long-lasting partnerships are being replaced by strategic, task-specific alliances that have more defined limits. Telecommunications also permit organizations to cooperate in a single effort (such as joining to form a statewide information highway) while continuing to compete in other, traditional ways, such as delivering classes or recruiting students.

The changing regulatory framework could also change the nature of alliances. The shrinking size of government and corporate downsizing in recent years has made it more difficult for business and industry to invest in joint ventures with higher education. Industry argues that deregulation will free up vast resources for such partnerships and lead to new forms of collaboration, but that remains to be seen. In the near future it appears that alliances with private firms will require more cost concessions from academic institutions than have been expected in the past.

Changes in telecommunications will, therefore, present opportunities for new, vastly expanded forms of collaboration, but challenges as well. Universities will have to pay close attention to both as they manage their transition into the information age.

CONCLUSION

Sixty-one years ago Congress passed the Communications Act of 1934, and the telephone—once a luxury for the few—soon became affordable to the vast majority of Americans. As Congress prepares to pass a major reform of telecommunications law and technology continues to change rapidly, higher education is being forced to examine the ways in which it can seize the opportunities presented by the Information Age. That means university leaders must reexamine their own priorities on their campuses and make their voices heard in the policy debates on the federal and state level.

Through teaching, research, and public service, America's state and land-grant universities create, preserve, and disseminate knowledge that is vital to our democratic way of life. It is in the public interest that public higher education be directly involved in the decisions that will pave the way for the communications revolution.

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